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TRIGLYCERIDE COMPOSITION CONTAINING TITANIUM DIOXIDE

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ABSTRACT OF THE DISCLOSURE

Lipoidal compositions containing (1) a lipid suitable for application to tissues of homeothermal animals, (2) at least one partial ester of a polyol, and (3) finely divided TiO_2 are described. The compositions are advantageous in that they can be used to whiten or to increase the light reflectance of products into which they are incorporated, and are further advantageous in that they form stable aqueous emulsions.

The invention relates to novel lipoidal compositions and more particularly to compositions containing a lipid, at least one partial ester of a polyol and finely divided TiO_2.

The invention is advantageous in that the compositions can be incorporated in comestible, cosmetic, and/or pharmaceutical products to whiten or to increase the light reflectance of such products. The invention is also advantageous in that the presence of TiO_2 in the compositions tends to stabilize aqueous emulsions formed from the compositions.

Examples of comestible products into which the lipoidal compositions of this invention can be incorporated include artificial dairy products such as coffee whiteners, filled milk, whipped toppings, sour cream substitutes, and the like; food coating compositions such as cake icings and enrobing compositions for candy; and beverages such as coffee, tea, and cocoa. Examples of cosmetic products include lipsticks, eye shadow, hand lotions, blemish cover lotions, and dentifrices. Examples of pharmaceutical products include dosage forms or carriers such as lotions, ointment bases, and suppositories.

The present invention provides a composition comprising a mixture of:

(a) A lipid suitable for contact with tissues of homeothermal animals,

(b) A minor amount of at least one partial ester of a polyol, and

(c) Finely divided TiO_2; said TiO_2 being present in an amount sufficient for raising the light reflectance of said lipid.

Compositions falling within the scope above described can be incorporated in a wide variety of products to whiten and increase their light reflectance. The compositions also form stable emulsions when incorporated in aqueous media.

The term "homeothermal animals" as used herein is intended to mean and to refer to animals that maintain a uniform body temperature despite ambient variations in atmospheric temperature.

The term "finely divided food grade TiO_2" as used herein is intended to mean and to refer to TiO_2 particles in rutile or in anatase crystalline forms or in mixtures of these forms wherein the TiO_2 is substantially free from impurities and is certified by a controlling food and drug authority as suitable for use in foods. Such finely divided TiO_2 is also characterized in that it is composed of particles having an average ultimate particle size between about 0.1 to about 0.7 micron.

The term "pigmentary food grade TiO_2" as used herein is intended to refer to finely divided food grade TiO_2 wherein the particles have an average particle size between about 0.28 and 0.32 micron and a particle size distribution such that the preponderance of the particles have an ultimate particle size between 0.2 and 0.4 micron.

The term "lipid" as used herein is intended to mean and to refer to fatty materials other than partial esters of polyols and fatty acids which are usually insoluble in water, and have limited solubility in alcohol, but are usually soluble in ethers, esters, and organic solvents. The term "lipid" includes, for example, liquid and solid triglycerides and mixtures thereof which are composed of acyl (e.g., carboxylic acid) esters of glycerine having from 4 to 26 carbon atoms in the acyl groups; fatty oils including drying oils, semi-drying oils, and non-drying oils; full esters of fatty acids and polyols other than glycerine; essential oils including terpenes, aldehydes, and fatty alcohols; waxes (e.g., esters of sterols and fatty acids); sterols (high molecular weight alcohols) which are usually solid at 77° F.; soaps; phosphates such as lecithins which are fatty materials containing phosphorous; glycol lipids which are fatty lipids containing a carbohydrate moiety; sulfo-lipids which are fatty lipids containing a sulfur moiety; amino lipids which are fatty materials containing amino acid moieties.

Substantially all of the above-described lipids can be employed in the compositions of this invention. However, triglycerides are generally preferred because of their wide availability and low cost. Advantageous triglycerides are those derived from vegetable grains and other plants as well as animal fats. Examples of such glycerides are corn, olive, cottonseed, soybean, wheat germ, coconut, and tucum oils as well as animal tallow and cocoa butter. Such glycerides are usually mixtures of triglycerides containing stearic, oleic, linoleic, linolenic, and palmitic acid groups or radicals chemically combined with glycerine.

Triglycerides which have been found to be particularly advantageous for use in the compositions of this invention are those having a Solid Fat Index of at least 50 at 50° F., as determined by the American Oil Chemists Society—Method Cd—10–57, revised 1960 and a mean slope of at least 1.6 calculated by the formula:

$$\text{Slope}=\frac{A-B}{20}$$

where A is a Solid Fat Index at a temperature of about 20° F. below the Wiley Melting Point; B is the Solid Fat Index at the temperature (° F.) of the Wiley Melting Point being determined by the American Oil Chemists Society Method Cc—2–38. Lipids falling within the scope of the foregoing are triglyceride fats sometimes referred to in the art as hard butters and which are described in U.S. Pats. 2,726,158, and 2,783,151. Domestic hard butter glycerides are generally mixtures of naturally occurring triglycerides which are rearranged or interesterified to provide a Wiley Melting Point between 84° and 124° F., a Solid Fat Index of at least 50 at 50° F., and a hard and brittle consistency at around normal room temperatures. These hard butters generally break sharply and suddenly at about 75° F., the brittle quality sometimes being referred to as "snap." Hard butters are usually physically stable within the normal ranges of ambient temperatures. Lauric hard butters (e.g., those derived from palm kernel and coconut oils) and domestic hard butters (e.g., those derived from soybean and cottonseed oils) are usually mixtures of glycerides containing C_{12}, C_{14}, C_{16}, and C_{18} fatty acids, although and, particularly in the case of lauric hard butters, they may also contain small amounts of C_6, C_8, C_{10}, and C_{20} fatty acid moieties. Ordinarily, hard butters contain only minor proportions of unsaturated fatty acid moieties and are usually prepared by mixing hydrogenated or partially hydrogenated